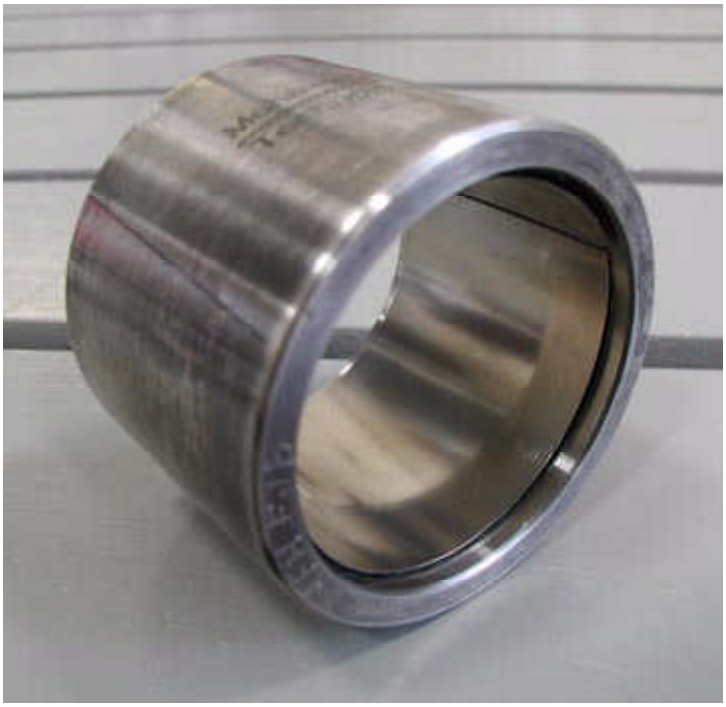
Oil-Free Turbomachinery Team Passed Milestone on Path to the First Oil-Free Turbine Aircraft Engine

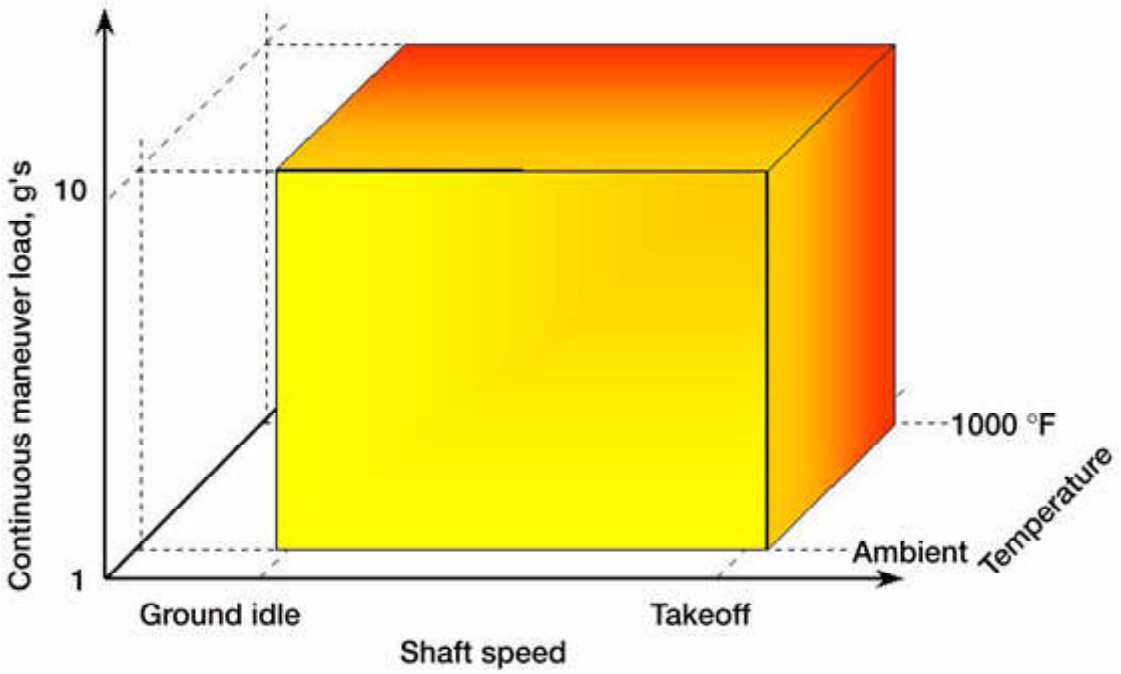
The Oil-Free Turbine Engine Technology Project team successfully demonstrated a foil-air bearing designed for the core rotor shaft of a turbine engine. The bearings were subjected to test conditions representative of the engine core environment through a combination of high speeds, sustained loads, and elevated temperatures. The operational test envelope was defined during conceptual design studies completed earlier this year by bearing manufacturer Mohawk Innovative Technologies and the turbine engine company Williams International. The prototype journal foil-air bearings were tested at the NASA Glenn Research Center.

Glenn is working with Williams and Mohawk to create a revolution in turbomachinery by developing the world's first Oil-Free turbine aircraft engine. NASA's General Aviation Propulsion project and Williams International recently developed the FJX-2 turbofan engine that is being commercialized as the EJ-22. This core bearing milestone is a first step toward a future version of the EJ-22 that will take advantage of recent advances in foil-air bearings by eliminating the need for oil lubrication systems and rolling element bearings. Oil-Free technology can reduce engine weight by 15 percent and let engines operate at very high speeds, yielding power density improvements of 20 percent, and reducing engine maintenance costs. In addition, with NASA coating technology, engines can operate at temperatures up to 1200 °F.



Core hot section foil-air bearing successfully tested in the level 1 milestone.

Although the project is still a couple of years from a full engine test of the bearings, this milestone shows that the bearing design exceeds the expected environment, thus providing confidence that an Oil-Free turbine aircraft engine will be attained. The Oil-Free Turbomachinery Project is supported through the Aeropropulsion Base Research Program.



Bearing test envelope exceeded the range of normal engine operating conditions.

Find out more about this research (http://www.grc.nasa.gov/WWW/Oilfree/).

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